

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application:

Claim 1 (currently amended): A system for measuring a characteristic of an optical article, comprising:

a light source for producing light;

an optical element for focusing the light along a probe path to converge at a reference location associated with an expected position of an optical article, ~~the reference location within the optical article or on a surface thereof wherein the reference location is movable during a scan to at least two different positions along an optical axis of the probe path;~~

a sensor for detecting the light from the at least two different reference locations during the scan, wherein the sensor comprises a position sensitive diode device operable to generate two signals, a first signal associated with a location of an intensity centroid along one direction and a second signal associated with a location of an intensity centroid along a second direction, the second direction orthogonal to the first direction; and

a processor, wherein the processor is configured to receive signals from the sensor associated with ~~a single~~ each spot of received light and determine a deflection angle and a direction of the deflection angle of the light from the probe path.

Claim 2 (previously presented): The system of claim 1, wherein the reference location is associated with an expected position of the surface of the optical article.

Claim 3 (previously presented): The system of claim 1, wherein the reference location is associated with an expected position within the optical article.

Claim 4 (original): The system of claim 1, further including a stage for translating an optical article relative to the light source and the probe path in at least one dimension.

Claim 5 (original): The system of claim 1, further including a stage for translating an optical article relative to the light source and the probe path in three dimensions.

Claim 6 (original): The system of claim 1, wherein the processor is further configured to determine a characteristic of the optical article based on the deflection angle of the light at multiple locations of the optical article.

Claim 7 (original): The system of claim 6, wherein the characteristic includes one or more of surface flatness, a divot feature, or a peak feature of the optical article.

Claim 8 (original): The system of claim 6, wherein the characteristic includes an index of refraction value.

Claim 9 (original): The system of claim 6, wherein the characteristic includes stored information.

Claims 10-12 (cancelled)

Claim 13 (previously presented): The system of claim 1, wherein the position sensitive diode device generates two signals, a first signal associated with a location of an intensity centroid along one direction and a second signal associated with a location of an intensity centroid along a second direction, the second direction orthogonal to the first direction.

Claim 14 (original): The system of claim 1, further including a second optical element positioned to focus the light beam from the reference location to a pinhole filter between the second optical element and the sensor.

Claim 15 (original): The system of claim 14, wherein the second optical element and pinhole filter are disposed in a confocal imaging configuration.

Claim 16 (original): The system of claim 1, where the sensor is positioned to detect light passing through the reference location.

Claim 17 (original): The system of claim 1, where the sensor is positioned to detect light reflected from the reference location.

Claims 18 – 25 (cancelled)

Claim 26 (previously presented): A method for measuring a characteristic of an optical article, comprising:

- scanning an optical article with a focused beam of light;
- detecting a deflection angle and a direction of the deflection angle of the focused beam of light from the optical article at multiple scan positions, wherein
 - the focused beam of light is focused during a scan to at least two different positions along an optical axis of the focused beam of light,
 - the deflection angle and a direction of the deflection angle for each of the multiple scan positions is determined from a single spot of light, and
 - for at least one of the multiple scan positions the focused beam converges within the optical article; and
- determining a characteristic of the optical article based on the deflection angles at the multiple scan positions.

Claim 27 (original): The method of claim 26, wherein the scan is performed along a first and second dimension, the first and second dimension orthogonal to the path of the focused beam of light.

Claim 28 (cancelled)

Claim 29 (original): The method of claim 26, wherein the focused beam of light from the optical article passes through a confocal imaging system.

Claim 30 (original): The method of claim 26, further including producing a surface relief pattern from the multiple deflection angles.

Claim 31 (original): The method of claim 26, further including producing an equivalent single surface plot from the multiple deflection angles.

Claim 32 (original): The method of claim 26, further including producing a volumetric index map.

Claim 33 (previously presented): The method of claim 26, wherein the beam of light is detected with a position sensitive diode device.

Claim 34 (previously presented): The system of claim 33, wherein the position sensitive diode device is operable to generate two signals, a first signal associated with a location of an intensity centroid along one direction and a second signal associated with a location of an intensity centroid along a second direction, the second direction orthogonal to the first direction.

Claim 35 (new): A system for measuring a characteristic of an optical article, comprising:

- a light source for producing light;

- an optical element for focusing the light along a probe path to converge at a reference location associated with an expected position of an optical article, the reference location within the optical article or on a surface thereof;

- a sensor for detecting the light from the reference location, wherein the sensor comprises a position sensitive diode device operable to generate two signals, a first signal associated with a location of an intensity centroid along one direction and a second signal associated with a location

of an intensity centroid along a second direction, the second direction orthogonal to the first direction;

a second optical element positioned to focus the light beam from the reference location to a pinhole filter between the second optical element and the sensor; and

a processor, wherein the processor is configured to receive signals from the sensor associated with a single spot of received light and determine a deflection angle and a direction of the deflection angle of the light from the probe path.

Claim 36 (new): The system of claim 35, wherein the second optical element and pinhole filter are disposed in a confocal imaging configuration.

Claim 37 (new): The system of claim 35, wherein the processor is further configured to determine a characteristic of the optical article based on the deflection angle of the light at multiple locations of the optical article.

Claim 38 (new): The system of claim 35, wherein the characteristic includes one or more of surface flatness, a divot feature, or a peak feature of the optical article.

Claim 39 (new): The system of claim 35, wherein the characteristic includes an index of refraction value.

Claim 40 (new): The system of claim 35, wherein the characteristic includes stored information.